



Air Quality Permitting Statement of Basis

January 24, 2006

Permit to Construct No. P-050503

**Western Farm Service, a Division of Agrum U.S., Inc.
Roberts Facility
Roberts, ID**

Facility ID No. 051-00020

Prepared by:

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AIR QUALITY DIVISION

FINAL

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Acronyms, Units, and Chemical Nomenclatures

| | |
|-------------------|--|
| acfm | actual cubic feet per minute |
| AFS | AIRS Facility Subsystem |
| AIRS | Aerometric Information Retrieval System |
| AP-42 | Compilation of Air Pollutant Emissions Factors. |
| AQCR | Air Quality Control Region |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| DEQ | Department of Environmental Quality |
| EI | emissions inventory |
| EPA | U.S. Environmental Protection Agency |
| HAPs | hazardous air pollutants |
| IDAPA | a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act |
| lb/hr | pound per hour |
| MACT | Maximum Achievable Control Technology |
| MMBtu | million British thermal units |
| NAAQS | national ambient air quality standard |
| NESHAP | National Emission Standards for Hazardous Air Pollutants |
| NO ₂ | nitrogen dioxide |
| NO _x | nitrogen oxides |
| NSPS | New Source Performance Standards |
| PM ₁₀ | particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers |
| PSD | Prevention of Significant Deterioration |
| PTC | permit to construct |
| Rules | Rules for the Control of Air Pollution in Idaho |
| SIC | Standard Industrial Classification |
| SIP | State Implementation Plan |
| SM | Synthetic Minor |
| SO ₂ | sulfur dioxide |
| SPA | superphosphoric acid |
| T/yr | tons per year |
| µg/m ³ | micrograms per cubic meter |
| VOC | volatile organic compound |
| WFS | Western Farm Service |

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200, Rules for the Control of Air Pollution in Idaho, for issuing permits to construct.

2. FACILITY DESCRIPTION

The Western Farm Service (WFS) facility in Roberts is a fertilizer manufacturing and retail facility. 10-34-0 ammonium polyphosphate liquid fertilizer is generated or produced in the facility's Reactor No. 1 (10-34-0 Reactor). In addition to the 10-34-0 liquid fertilizer, the facility also produces fertilizer mixtures including high potassium fertilizer (0-0-13), ammonium sulfate/urea solution (21-0-0-7), ammonium sulfate solution (8-0-0-9), and ammonium sulfate (21-0-0). Per the information provided by the applicant, producing fertilizer mixtures does not generate air emissions, other than 10-34-2 production. Ammonium thiosulfate liquid (12-0-0-26) and urea ammonium nitrate liquid (32-0-0) are not produced at the facility, but are shipped to the facility for retail sale.

3. FACILITY / AREA CLASSIFICATION

This facility is classified as a synthetic minor facility because its potential to emit is limited to less than all Tier I operating permit major facility thresholds. The facility is not subject to federal NSPS or NESHAP requirements. The SIC code defining the facility is 2874. The AIRS facility classification is "SM."

The facility is located within AQCR 61 and UTM zone 12. The facility is located in Jefferson County which is classified as unclassifiable for all criteria air pollutants (PM₁₀, CO, NO_x, SO₂, lead, and ozone). There are no class I areas within ten kilometers of the facility.

The AIRS information provided in Appendix A defines the classification for each regulated air pollutant at this facility. This required information is entered into the EPA AIRS database.

4. APPLICATION SCOPE

WFS has submitted a PTC application for the 10-34-0 Reactor as required by a Consent Order issued by DEQ in February 2005. The application also includes emissions information for storage tanks associated with the reactor, and emissions information for facility's propane-fired boiler, Boiler No.1. The application also includes emissions information for ten storage tanks that are associated with the reactor, which are not regulated by this PTC as described in Section 5.4 and 5.5.

4.1 Application Chronology

| | |
|-------------------|--|
| May 16, 2005 | DEQ received the PTC application. |
| June 15, 2005 | DEQ declared the application complete. |
| September 6, 2005 | DEQ received an addendum dated September 2, 2005 to the permit application, which provided a description of the wet scrubber and demister pads as process equipment. |

5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC action.

5.1 **Equipment Listing**

Reactor No.1 (10-34-0 Reactor)

The 10-34-0 reactor was custom made by Unocal in 1985. It replaced the facility's existing reactor. Superphosphoric acid (SPA), ammonia, and water are fed to the reactor at the rates of 1,500, 1,080, and 2,100 gallons per hour, respectively. 10-34-0 ammonium polyphosphate liquid fertilizer is generated at the rate of 2,800 gallons per hour.

The reactor has the following stack parameters:

| | |
|---------------------------|--------|
| Stack ID | STK01 |
| Stack height (ft) | 17 |
| Stack exit diameter* (ft) | 9.16 |
| Stack gas volume (acfm) | 36,800 |
| Exit gas temperature (°F) | 117 |

* The annular (ring-like) stack surrounds the cylindrical reactor and has an outer diameter of 10 feet and an inner diameter of four feet

A wet scrubber (a packed bed) and stainless-steel demister pads are integral components of the reactor design. Their primary design function is to optimize the recovery of the liquid fertilizer. As the wet scrubber and the demister pads recover the liquid fertilizer, they also reduce the temperature of the liquid fertilizer and control air pollutant emissions exiting the reactor stack. A reduction in the post-reaction vapor temperature provides for condensation of liquid fertilizer to optimize fertilizer recovery in the off-gas stream.

Per the applicant, the actual operating schedule is eight hours per day, four days per week, and 10 weeks per year.

Storage tanks

Nineteen 10-34-0 storage tanks are filled to capacity during the production period from approximately October 20 through December 25, and are used to supply the demand for sales throughout the remainder of the year.

One feed stock storage tank for SPA is only used during active production of 10-34-0 product.

Boiler No.1

The 3.35 MMBtu/hr propane-fired boiler is used during 10-34-0 production and for other heating purposes at the facility. The current operating schedule for Boiler No.1 is less than 2,500 hours per year; DEQ's modeling indicates that the boiler can operate 24 hours per day and 6,552 hours per year without causing or significantly contributing to a violation of any ambient air quality standards. The emissions from the boiler are uncontrolled.

The boiler has the following stack parameters:

| | |
|---------------------------|-------|
| Stack ID No. | STK02 |
| Stack height (ft) | 12 |
| Stack exit diameter (ft) | 1.5 |
| Stack gas volume (acfm) | 125 |
| Exit gas temperature (°F) | 500 |

5.2 Emissions Inventory

A detailed emissions inventory (EI) was provided in the PTC application. The EI has been reviewed by DEQ and appears to accurately reflect emissions from the facility. Table 5.2 provides a summary of the EI at the proposed operating schedule – eight hours per day and 180 days per year or 1,440 hours per year. The hourly emissions rates from the reactor are based on the source test data. The hourly emissions rates from the propane boiler were calculated using emissions factors from AP-42 Section 1.5 (rev. 10/96) and the boiler's rated capacity. The proposed annual emissions rates were calculated by multiplying the hourly emissions by 1,440 hours per year. The annual VOC emissions rate from the tanks was estimated using EPA TANK 4.0 software. The annual fluorides emissions rate from the tanks was calculated by multiplying tanks' total VOC emissions rate by fluorides mass fraction of 2.70×10^{-3} gram fluorides/gram 10-34-0 product. The hourly VOC and fluoride emissions rates from the tanks were calculated by dividing annual rates by 8,760 hours per year (because the tanks store product year round).

Table 5.2 EMISSIONS ESTIMATES AT PROPOSED SCHEDULE

| Emissions Unit | PM ₁₀ | | Fluorides | | SO ₂ | | VOC | | NO _x | | CO | |
|--------------------------------|------------------|-------|-----------|--------|-----------------|-------|-------|--------|-----------------|------|-------|-------|
| | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr |
| Reactor No.1 (10-34-0 reactor) | 2.6 | 1.9 | 1.4 | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- |
| Boiler No.1 (Propane boiler) | 0.015 | 0.011 | --- | --- | 0.055 | 0.040 | 0.011 | 0.0079 | 0.51 | 0.37 | 0.07 | 0.050 |
| 20 Storage tanks | --- | --- | 2.3E-04 | 0.0010 | --- | --- | 0.085 | 0.37 | --- | --- | --- | --- |
| Total | | 1.9 | | 1.0 | | 0.04 | | 0.38 | | 0.37 | | 0.050 |

5.3 Modeling

The facility has demonstrated compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The detailed modeling analysis is included in Appendix B. A summary of the modeling analysis is presented in Table 5.3.

Table 5.3 FULL IMPACT ANALYSIS RESULTS FOR PM₁₀

| Pollutant | Averaging Period | Ambient Impact from the Reactor Stack and the Boiler Stack (µg/m ³) ^a | Background concentration (µg/m ³) | Total Ambient Concentration (µg/m ³) | NAAQS (µg/m ³) | Percent of NAAQS |
|------------------|------------------|--|---|--|----------------------------|------------------|
| PM ₁₀ | 24-hour | 67.9 (24 hours continuous operation) | 73 | 149.9 | 150 | 94% |
| | Annual | 18.4 (6,552 hours per year) | 26 | 44.4 | 50 | 89% |

^a DEQ's modeling analysis indicates that the reactor can operate 24 hours a day and 6,552 hours per year without causing or significantly contributing to a violation of any ambient air quality standard.

5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201 Permit to Construct Required

Reactor No.1 and the boiler were installed in 1985 and 1980, respectively, without obtaining a PTC. They require a PTC.

IDAPA 58.01.01.203.02..... NAAQS

“No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:02. NAAQS....”

The facility has demonstrated compliance, to DEQ’s satisfaction, that this project will not cause or significantly contribute to a violation of any ambient air quality standards of PM₁₀. The emissions of CO, NO₂, and SO₂ are below the modeling thresholds for criteria pollutants set in *State of Idaho Air Quality Modeling Guideline*. Therefore, no modeling analysis is required for these pollutants. The summary of the modeling analysis is in Table 5.3. Detailed modeling analysis is included in Appendix B.

IDAPA 58.01.01.203.03 Toxic Air Pollutants

“No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:03. Toxic Air Pollutants Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.”

The emissions units were installed prior to 1995. The toxic rules do not apply to these emissions units.

IDAPA 58.01.01.625 Visible Emissions

This regulation states that any point of emission shall not have a discharge of any air pollutant for a period aggregating more than three minutes in any 60-minute period of greater than 20% opacity.

The emissions points at this facility are subject to this regulation.

IDAPA 58.01.01.675 Fuel Burning Equipment

This regulation establishes particulate matter emission standards (grain loading standards) for fuel burning equipment. Fuel burning equipment is defined in IDAPA 58.01.01.006.41 as, “Any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer.”

This regulation is applicable to the propane-fired boiler. As long as the boiler is fired by propane, the boiler is in compliance with this grain loading standard.

IDAPA 58.01.01.701 Process Weight Limitations

The reactor is subject to this regulation. The reactor’s source test data indicated that the reactor PM emissions were below the process weight rate emissions limit. Therefore, the reactor is in compliance with this regulation.

40 CFR 60 New Source Performance Standards

The storage tanks in the facility are not subject to NSPS (i.e. 40 CFR 60 Subparts K, Ka, and Kb) because the tanks don’t contain petroleum liquids and the vapor pressure of each tank is less than the threshold in the NSPS.

40 CFR 61 and 63 National Emission Standards for Hazardous Air Pollutants & MACT

This facility is not subject to 40 CFR 63 Subpart BB because it is not a major source as defined in 40 CFR 63.2.

5.5 Permit Conditions Review

- 5.5.1 Permit Condition 2.3 establishes the reactor's potential to emit PM₁₀. It is based on the operating schedule requested by the application - eight hours per day and 180 days per year or 1,440 hours per year. The processing fee of this PTC was calculated based on this permit limit.
- 5.5.2 Permit Condition 2.4 limits the opacity from the reactor's stack to no more than 20% for a period or periods aggregating three minutes in any 60-minute period.
- 5.5.3 Permit Condition 2.5 limits the hours the reactor operates to 1,440 hours per any consecutive 12-month period. This is the operating limit requested by the applicant.
- 5.5.4 Permit Condition 2.6 requires that the facility develop an O&M manual for the reactor within 60 days of issuance of the permit.
- 5.5.5 Permit Condition 2.7 requires that the permittee operate the reactor according to the O&M manual.
- 5.5.6 Permit Condition 2.8 requires the permittee to monitor and record monthly and annually the number of hours the reactor operates to demonstrate compliance with the annual operating hours limit.
- 5.5.7 Permit Condition 3.4 limits PM emissions from the boiler to the grain loading standard for fuel burning equipment. As long as the boiler is fired by propane, it complies with the grain loading standard. Therefore, no specific monitoring is required in the permit.

6. PERMIT FEES

WFS, Roberts's facility submitted a \$1,000 PTC application fee on May 16, 2005, in accordance with IDAPA 58.01.01.224. The facility's emissions increase is between one to ten tons range. In accordance with IDAPA 58.01.01.225, the PTC processing fee is \$2,500. DEQ received the \$2,500 processing fee May 16, 2005.

Table 5.1 PTC PROCESSING FEE TABLE

| Emissions Inventory | | | |
|---------------------|----------------------------------|-----------------------------------|--------------------------------|
| Pollutant | Annual Emissions Increase (T/yr) | Annual Emissions Reduction (T/yr) | Annual Emissions Change (T/yr) |
| NO _x | 0.37 | 0 | 0.37 |
| SO ₂ | 0.04 | 0 | 0.04 |
| CO | 0.050 | 0 | 0.050 |
| PM ₁₀ | 1.9 | 0 | 1.9 |
| VOC | 0.38 | 0 | 0.38 |
| TAPS/HAPS | 1.0 | 0 | 1.0 |
| Total: | 3.74 | 0 | 3.74 |
| Fee Due | \$ 2,500.00 | | |

7. PERMIT REVIEW

7.1 Regional Review of Draft Permit

The draft permit was sent to Idaho Falls Regional Office review on August 25, 2005. The regional office has no comments on the draft permit.

7.2 Facility Review of Draft Permit

The draft permit was sent for facility review on November 17, 2005. The comments were addressed.

7.3 Public Comment

An opportunity for public comment period on the PTC application was provided in accordance with IDAPA 58.01.01.209.01.c. During this time, there were not comments on the application and no requests for a public comment period on DEQ's proposed action.

8. RECOMMENDATION

Based on review of the application materials, and all applicable state and federal rules and regulations, staff recommend that Western Farm Service be issued final PTC No. P-050503 for its Roberts facility. No public comment period is recommended, no entity has requested a comment period, and the project does not involve PSD requirements.

SYC/sd Permit No. P-050503

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Appendix A

AIRS Information

P-050503

AIRS/AFS^a FACILITY-WIDE CLASSIFICATION^b DATA ENTRY FORM

Facility Name: Western Farm Service, a Division of Agrium U.S., Inc. Roberts Facility
Facility Location: Roberts, ID
AIRS Number: Facility ID No. 051-00020

| AIR PROGRAM POLLUTANT | SIP | PSD | NSPS (Part 60) | NESHAP (Part 61) | MACT (Part 63) | SM80 | TITLE V | AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment |
|--------------------------|-----|-----|-------------------|---------------------|-------------------|------|---------|---|
| SO ₂ | B | | | | | | B | U |
| NO _x | B | | | | | | B | U |
| CO | B | | | | | | B | U |
| PM ₁₀ | B | | | | | | B | U |
| PT (Particulate) | B | | | | | | B | |
| VOC | B | | | | | | B | U |
| THAP (Total HAPs, HF) | | | | | | | SM | |
| APPLICABLE SUBPART | | | | | | | | |
| | | | | | | | | |

^a Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

^b AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, or each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).
- HF = hydrogen fluoride (hydrofluoric acid).

Appendix B

Modeling Review

P-050503

MEMORANDUM

DATE: October 5, 2005

TO: Shawnee Chen, Permit Writer, Air Program

FROM: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program 

PROJECT NUMBER: P-050503

SUBJECT: Modeling Review for the Western Farm Services Permit to Construct Application for their facility in Roberts, Idaho.

1.0 SUMMARY

Western Farm Service (WFS) submitted a Permit to Construct (PTC) application for previously unpermitted sources at their farm chemical retail and manufacturing facility located near Roberts, Idaho. Air quality analyses involving atmospheric dispersion modeling of emissions associated with the facility were submitted in support of a permit application to demonstrate that the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02).

A technical review of the submitted air quality analyses was conducted by DEQ. The submitted modeling analyses in combination with DEQ's staff analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

| Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES | |
|---|---|
| Criteria/Assumption/Result | Explanation/Consideration |
| Emissions from the reactor were estimated by WFS to occur only for an eight-hour period between 9 am and 5 pm for calculating 24-hour averaged impacts. | Although analyses submitted by the applicant only modeled emissions during the eight-hour period, DEQ analyses showed that compliance could be demonstrated for emissions occurring 24 hours per day. |
| Compliance with the annual PM ₁₀ standard can be demonstrated if monthly emissions from the reactor do not exceed 75% of capacity. | WFS proposed an annual limit of 180 days/year. DEQ modeling showed continual operation (24 hr/day) for 273 days would still assure compliance with the annual PM ₁₀ NAAQS. |

2.0 BACKGROUND INFORMATION

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 Area Classification

The WFS facility is located in Jefferson County, designated as an attainment or unclassifiable area for sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), lead (Pb), ozone (O₃), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM₁₀).

3.0 MODELING IMPACT ASSESSMENT

3.1 Modeling Methodology

Table 4 provides a summary of the modeling parameters used in the DEQ verification analyses.

| Table 4. MODELING PARAMETERS | | |
|------------------------------|--------------------|--|
| Parameter | Description/Values | Documentation/Additional Description |
| Model | ISC-PRIME | ISC-PRIME version 04269. |
| Meteorological data | 1987-1991 | Pocatello surface data; Boise upper air data |
| Terrain | Not considered | Area is effectively flat for dispersion modeling purposes. |
| Building downwash | PRIME algorithm | Building dimensions obtained from modeling files submitted |
| Receptor grid | Grid 1 | 25-meter spacing along boundary out to 100 meters |
| | Grid 2 | 50-meter spacing out to 500 meters |
| | Grid 3 | 100-meter spacing out to 2000 meters |

3.1.1 Modeling protocol

A protocol was not submitted to DEQ prior to submission of the application. With the exception of several methods discussed later in this report, modeling was conducted using methods and data presented in the State of Idaho Air Quality Modeling Guideline.

3.1.2 Model Selection

ISCST3 was used by WFS to conduct the ambient air analyses. ISCST3 is not the recommended model in this instance because numerous ambient air receptor locations exist within building recirculation cavities. ISCST3 does not calculate concentrations within recirculation cavities. DEQ verification analyses were conducted using ISC-PRIME. ISC-PRIME incorporates the PRIME downwash algorithm, which is also used in AERMOD, the proposed replacement model for ISCST3. The PRIME algorithm is superior to the existing downwash algorithms within ISCST3 and is capable of estimating concentrations within building recirculation cavities.

3.1.3 Meteorological Data

Site-specific meteorological data are not available for the WFS site in Roberts. Pocatello is the closest area where model-ready surface meteorological data are available. These data, in combination with upper air data from Boise, were used in the modeling analyses.

PCRAMMET, the meteorological data preprocessor for ISCST-3, occasionally generates unrealistically low mixing heights as a result of interpolation algorithms used with the twice daily measured mixing heights. DEQ verification modeling was conducted using meteorological data corrected for low mixing heights. All mixing height values below 50 meters were replaced with a value of 50 meters.

3.1.4 Terrain Effects

The modeling analyses submitted by WFS did not consider elevated terrain. Review of a topographic map indicates the area is effectively flat for dispersion modeling purposes, especially considering that maximum impacts are located very near the emission source.

3.1.5 Facility Layout

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the modeling input to a facility plot plan submitted with the application and aerial photographs of the area.

3.1.6 Building Downwash

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analyses. The Building Profile Input Program for the PRIME downwash algorithm (BPIP-PRIME) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters for ISC-PRIME.

3.1.7 Ambient Air Boundary

The WFS property boundary fence was used as the ambient air boundary, in accordance with procedures described in the State of Idaho Air Quality Modeling Guideline.

3.1.8 Receptor Network

The receptor grids used by WFS met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. However, because of the close proximity of the emission source to ambient air receptors, DEQ was not satisfied the receptor spacing used was sufficient to reasonably resolve maximum modeled concentrations. DEQ verification analyses were conducted using a more dense receptor grid with 25-meter spacing out to 100 meters.

3.2 **Emission Rates**

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application, the engineering technical memorandum, and the proposed permit. The following approach was used for DEQ verification modeling:

All modeled emissions rates were equal to or greater than the facility's emissions calculated in the PTC application or the permitted allowable rate.

More extensive review of modeling parameters selected was conducted when model results for specific sources approached applicable thresholds.

Table 5 lists emissions rates for sources included in the dispersion modeling analyses. WFS modeled emissions from the reactor for eight hours per day, between the hours of 9:00 am and 5:00 pm. DEQ verification analyses were conducted assuming continual emissions at the allowable rate of 2.6 lb/hr. Also, emissions from the boiler were not included in the analyses submitted by WFS. DEQ was not satisfied with the claim that these emissions would have a negligible impact on ambient air receptors and included this source in the verification analyses.

| Table 5. MODELED PM ₁₀ EMISSIONS RATES | | |
|---|----------------|------------------------|
| Source Id | Description | Emission Rates (lb/hr) |
| STK01 | Reactor stack | 2.6 ^a |
| BOILER | Propane boiler | 0.015 ^b |

^a Modeled by WFS at 8 hr/day from 9:00 am – 5:00 pm.

^b Not included in the modeling analyses submitted by WFS.

3.3 **Emission Release Parameters**

Table 6 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity. Values used in the analyses appeared reasonable and within expected ranges. Additional documentation /verification of these parameters were not required.

| Table 6. EMISSIONS AND STACK PARAMETERS | | | | | |
|---|-------------|-------------------------------|----------------------|----------------------------------|--|
| Release Point /Location | Source Type | Stack Height (m) ^a | Modeled Diameter (m) | Stack Gas Temp. (K) ^b | Stack Gas Flow Velocity (m/sec) ^c |
| STK01 | Point | 5.2 | 2.8 | 320 | 2.8 |
| BOILER | Point | 3.7 | 0.46 | 533 | 0.36 |

^a Meters

^b Kelvin

^c Meters per second

3.4 Results for Full Impact Analyses

Impacts of facility-wide emissions were well over the SCLs, thereby requiring full impact analyses for PM₁₀. Results of the WFS-submitted full impact analyses and DEQ's verification analyses are shown in Table 7. As shown, DEQ's 24-hour verification analyses indicated lower impacts than the WFS analyses. This is likely a result of using the PRIME downwash algorithm, shown to more accurately assess impacts from plume downwash caused by the presence of structures. DEQ annual verification analyses showed much higher results than those submitted by WFS. This is primarily because DEQ analyses assumed 273 days per year operation and the WFS analyses assumed a less conservative operational schedule of 180 days per year.

| Table 7. RESULTS OF PM ₁₀ FULL IMPACT ANALYSES | | | | | |
|---|---|---|---|---|------------------|
| Averaging Period | Maximum Modeled Concentration (µg/m ³) ^a | Background Concentration (µg/m ³) | Total Ambient Impact (µg/m ³) | NAAQS ^b (µg/m ³) | Percent of NAAQS |
| 24-hour | 67.9 (73) | 73 | 140.9 (146) | 150 | 94 |
| Annual | 18.4 (1.9) | 26 | 44.4 (27.9) | 50 | 89 |

^a Micrograms per cubic meter

^b Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

^c National ambient air quality standards

4.0 CONCLUSIONS

The ambient air impact analysis submitted, in combination with DEQ's verification analyses, demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application, will not cause or significantly contribute to a violation of any air quality standard.